

1/11/16

"Id rather you not finish but understand, then finish and not understand."-Mr. Callahan

HW: Text page 215-216 #4-16 even and #26-36 even

AIM: What are Complex Numbers? How do we Add/Subtract and Multiply them?

Warm Up:

Simplify

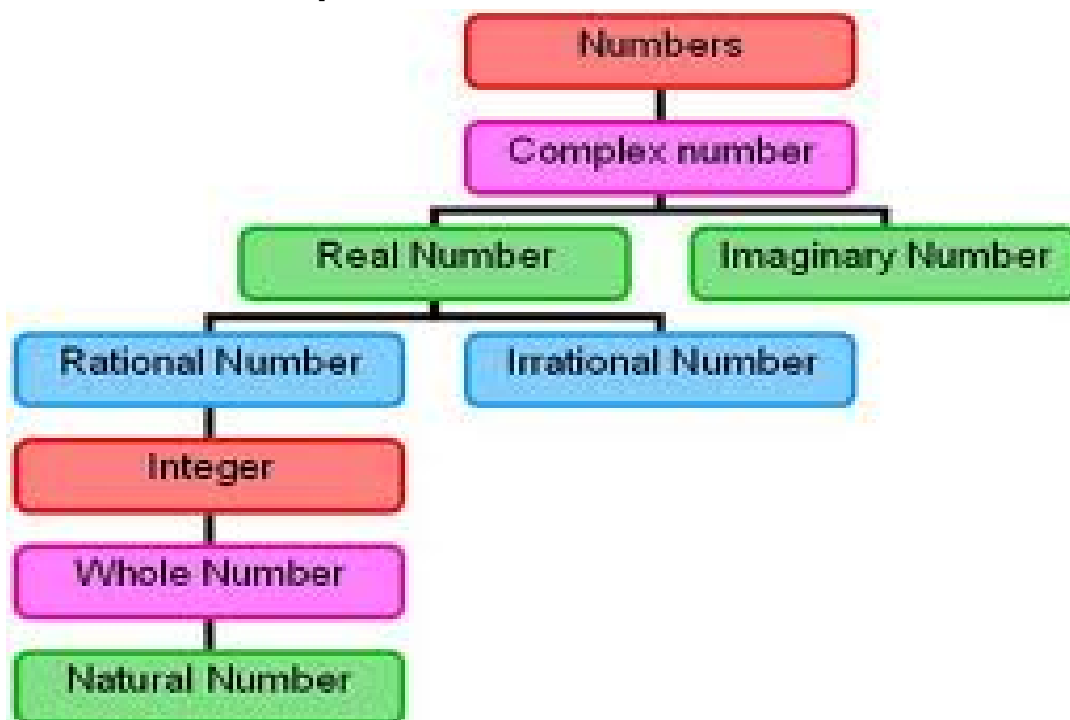
1) $(6+7x) + (1+2x)$

$$6+7x+1+2x$$
$$7+9x$$

2) $(3+2x)(3+3x)$

$$9+9x+6x+6x^2$$
$$6x^2+15x+9$$

What is a Complex Number?



Complex numbers are in the form of:

$$a + bi$$

real part (red arrow pointing to a) *imaginary part* (blue arrow pointing to bi)

where a and b are real numbers and $i = \sqrt{-1}$

$$2 + 0i \text{ is } 2$$

We add/subtract complex numbers very similar to the way that we add/subtract binomials.

- Combine the real components
- Combine the imaginary components

3) $(4+3i) + (2+5i)$

$$\underline{4+3i} + \underline{2+5i}$$

$$4+2=6$$

$$3i+5i=8i$$

$$6+8i$$

4) $(3+2i) + (1-2i)$

$$4+0i = 4$$

5) $(5+3i) - (2+8i)$

$$5-2=3$$

$$3i-8i=-5i$$

$$3-5i$$

6) $(1+2i) - (1-9i)$

$$1-1=0$$

$$2i-(-9i)=11i$$

$$0+11i=11i$$

We also multiply complex numbers similar to the way we multiply other binomials (EWE) "Everything With Everything"

$$7) (5+2i)(3+4i)$$

$$15 + 20i + 6i + 8i^2$$

$$i^2 = -1$$

$$15 + 26i + 8i^2$$

$$15 + 26i + 8(-1)$$

$$15 + 26i - 8$$

$$7 + 26i$$

$$8) (9+3i)(9-3i)$$

⊗ When multiply conjugate complex pairs:

$$(a+bi)(a-bi) = a^2 + b^2$$

$$i^2 = (\sqrt{-1})^2 = -1$$

$$i^1 = i$$

$$i^2 = -1$$

$$i^3 = -i$$

$$i^0 = i^4 = 1$$